

CLAIMS

What is claimed is:

5 1. A method for forming an adhesion between dielectric layers,
the method comprising:

 providing a first dielectric layer; and

 in-situ forming a second dielectric layer having a first portion on
said first dielectric layer and a second portion on said first portion,
10 wherein said first portion has a first dielectric constant higher than said
second portion has.

 2. The method according to claim 1, wherein said first dielectric
layer has a second dielectric constant which is higher than said second
15 portion.

 3. The method according to claim 1, wherein the in-situ forming
step having at least a process condition for forming said first portion and
said second portion.

20 4. The method according to claim 3, wherein the in-situ forming
step having said process condition comprises:

 executing a chemical vapor deposition having a first bias; and

 executing said chemical vapor deposition having a second bias,

25 wherein said first bias is higher than said second bias.

 5. The method according to claim 3, wherein the in-situ forming
step having said process condition comprises:

executing a chemical vapor deposition having a first HFRF for forming said first portion; and

executing said chemical vapor deposition having a second HFRF, wherein said first HFRF is higher than said second HFRF.

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6. The method according to claim 3, wherein the in-situ forming step having said process condition comprises:

executing a chemical vapor deposition having a first precursor for forming said first portion; and

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executing said chemical vapor deposition having a second precursor, wherein the amount of said first precursor is less than the amount of said second precursor.

7. The method according to claim 1, wherein the in-situ forming step comprises plasma enhanced chemical vapor deposition (PECVD).

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8. A method for forming an adhesion between dielectric layers, the method comprising:

providing a first dielectric layer; and

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in-situ forming a second dielectric layer having a first portion on said first dielectric layer and a second portion on said first portion, wherein said first portion has a hardness higher than said second portion has.

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9. The method according to claim 8, wherein said first dielectric layer has a dielectric constant which is higher than said second dielectric layer.

10. The method according to claim 8, wherein the in-situ forming step at least comprises:

executing a chemical vapor deposition having a first bias for forming said first portion; and

5 executing said chemical vapor deposition having a second bias for forming said second portion, wherein said first bias is higher than said second bias.

11. The method according to claim 8, wherein the in-situ forming step at least comprises:

10 executing a chemical vapor deposition having a first HFRF for forming said first portion; and

15 executing said chemical vapor deposition having a second HFRF for forming said second portion, wherein said first bias is higher than said second bias.

12. The method according to claim 8, wherein the in-situ forming step at least comprises:

20 executing a chemical vapor deposition having a first precursor for forming said first portion; and

executing said chemical vapor deposition having a second precursor for forming said second portion, wherein said first bias is higher than said second bias.

25 13. The method according to claim 1, wherein the in-situ forming step comprises:

executing a chemical vapor deposition having a first process condition; and

executing said chemical vapor deposition having a second process condition, wherein said second process condition forming said second portion having a dielectric constant smaller than said first process condition forming said first portion.

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14. The method according to claim 13, wherein said executing said chemical vapor deposition is plasma enhanced chemical vapor deposition (PECVD).

10 15. An structure of enhanced-inter-adhesion dielectric layers, the structure comprising:

a first dielectric layer; and

a second dielectric layer having a first portion on said first dielectric layer and a second portion on said first portion, wherein said
15 first portion has a first dielectric constant around 2.8 to 3.5 higher than said second portion.

16. The structure according to claim 15, wherein said first dielectric layer is silicon nitride (SiN).

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17. The structure according to claim 15, wherein said first dielectric layer is silicon carbide (SiC).

18. The structure according to claim 15, wherein said second
25 portion has a second dielectric constant around 1.1 to 3.